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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	
Kanji HATA et al.	:	Docket No.00177/527415
Serial No. 09/010,490	:	Group Art Unit 3729
Filed January 21, 1998	:	Examiner S. SMITH

COMPONENT MOUNTING APPARATUS AND METHOD, AND COMPONENT MOUNTING EQUIPMENT

THE COMMISSIONER IS AUTHORIZED TO CHARGE ANY DEFICIENCY IN THE FEES FOR THIS PAPER TO DEPOSIT ACCOUNT NO. 23-0975

3/15/02

REQUEST FOR RECONSIDERATION

Assistant Commissioner for Patents,
Washington, D.C.

RESPONSE UNDER 37. CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 3729.

Sir:

The period for response, set in the Office Action of October 10, 2001, was extended for two (2) months by the petition filed on February 22, 2002.

In the previous Office Action, claims 8-11, 13-15 and 18-28 are rejected over the prior art, with the Examiner particularly relying on Dornes (U.S. Patent No. 4,573,262) and JP 63178596. The Examiner is respectfully requested to reconsider the rejections in view of the following remarks.

In the present invention, the first mounting head section is capable of mounting a plurality of picked-up components onto a board, while the second mounting head section successively picks up (by suction) a plurality of components at the other of the component supply tables. Therefore, during an operation of the one mounting head section, such as a component sucking operation or a component mounting operation, it is possible to

prevent the other mounting head section from moving over a large range of the board and the component supply tables, thereby preventing the occurrence of large vibrations caused by such movements. Accordingly, component sucking and mounting operations can be performed with a high degree of accuracy.

In contrast, each of the **Dornes** and **JP 63178596 references** merely teaches respective operations of two heads. However, neither reference teaches or suggests any apparatus that would operate so as to prevent the occurrence of large vibrations caused by such movements over a large range of the board and the component supply tables. That is, when two heads are respectively and independently operated during sucking and mounting operations, one head carries out a sucking or mounting operation, while the other head carries out such movements over a large range of the board and the component supply tables. The movements involved in these operations generate large vibrations, which deteriorate the quality of the sucking or mounting operations. In addition, the components stored in the component supply tables might shift due to the above-described vibrations, thereby resulting in sucking operation failures.

For example, when the one head starts to move from the component supply table to the board, and when the one head stops at the board, large vibrations can be generated due to the start and stop **(i.e., the acceleration and deceleration)** of the one head, and in turn, the generated vibrations can affect the sucking and mounting operations of the other head. That is, the other head may be subjected to the large vibrations generated by

the operation of the one head, and thus, the positions of the components held by the other head may shift, thereby reducing the accuracy of the component mounting operation.

In general, in the prior art apparatuses, in order to prevent the operations from being affected by such large vibrations, after starting or stopping the one head, the operation of the other head should be stopped for a certain amount of time. The necessity to stop the operation of the other head undesirably increases the processing time.

Furthermore, when processing time is reduced, and the moving speeds of the heads are increased, the above-described vibrations may also increase, thus making it necessary to increase the stop time.

According to JP 63178596, as described on page 11, lines 22-28 of the translation, when a collision or the like is judged to be possible in step 4, the head is stopped, thus avoiding the collision or the like. That is, in JP 63178596, when the one head carries out a component mounting operation, the other head moves to a board for a component mounting operation and then stops near the one head. This means that large vibrations may be generated by the start and stop of the other head, which may result in adverse effects, such as reduced accuracy of the mounting operation of the one head. Accordingly, in order to avoid such adverse effects, the mounting operation of the one head should be stopped from the start to the stop of movement of the other head in addition to a certain amount of time after the stop of movement, which results in increased processing time.

In contrast, in the present invention, the negative effects caused by the acceleration or deceleration of any of the heads is avoided because, when one head carries out a sucking operation, the other head carries out a mounting operation. This arrangement does not result in increased processing time because **there is no waiting time to avoid the negative affects of generated vibrations**. Thus, the present invention can reduce the processing time in comparison with the applied prior art references. Note, each of independent claims 8, 18 and 24 requires that the first mounting head section be capable of mounting the plural picked-up components onto the board while the second mounting head section successively picks up the plural components at the other of the component supply tables. Clearly, any combination of Dornes and JP 63178596 would not disclose first and second mounting heads that are capable of operating in the manner specified in the independent claims.

Therefore, it is submitted that the collective teachings of the Dornes and JP 63178596 does not teach or suggest the novel feature of the present invention, as set forth in independent claims 8, 18 and 24. The Examiner therefore is requested to withdraw the rejections of claims 8-15 and 18-28 and pass this application to issue.

In the event that the Examiner has any comments or suggestions of a nature necessary to place this case in condition for allowance, then the Examiner is requested to contact Applicant's undersigned attorney by telephone to promptly resolve any remaining matters.

Respectfully submitted,

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By: _____

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